

**MANUFACTURABLE CHROMELESS
ALTERNATING PHASE SHIFT MASK
STRUCTURE WITH PHASE GRATING**

ABSTRACT OF THE DISCLOSURE

[0032] A chromeless APSM structure may be used to enable the pitch of features on the mask to be decreased by removing the chrome line between features, and thus remove the limit based on the size of the chrome line. The chromeless APSM may include primary features surrounded by a boundary region including sub resolution features. A relatively high precision lithography tool may be used in a first lithography step to print the features in the chromeless APSM structure. The boundary region may allow for a less precise lithography tool to be used in a second lithography step.